HS TYPE CARBURETTER KIT

Servicing and Tuning Guide
IMPORTANT: Read before Commencing Work

These instructions are intended as a general guide to servicing and tuning the type HS carburetter in both single and multi-installations. It is essential, particularly where vehicles are equipped and tuned to comply with engine emission control regulations, that the carburetters are tuned in accordance with the vehicle manufacturer's tuning data.

To achieve the best results when tuning, the use of a reliable tachometer, balancing meter and an exhaust gas analyser are required. **These instruments are essential when tuning vehicles equipped to conform with exhaust emission regulations.**

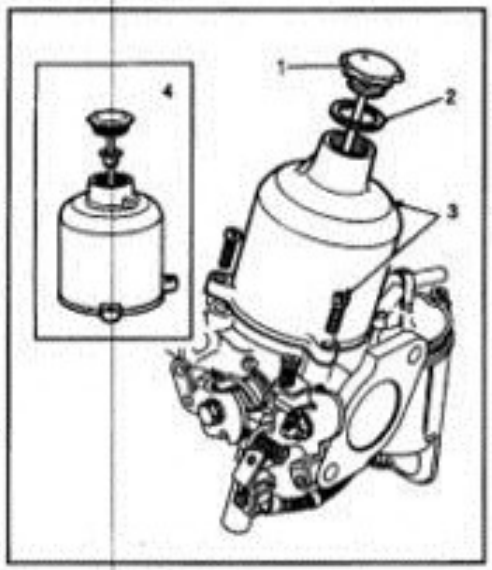
Before servicing or tuning a carburetter in an endeavour to rectify poor engine performance, make sure that the maladjustment or fault is not from another source by checking the following:

Valve clearance
Spark plug condition
Contact breaker (dwell angle)
Ignition timing and advance
Presence of air leaks into the induction system

This Kit contains only Genuine SU Components

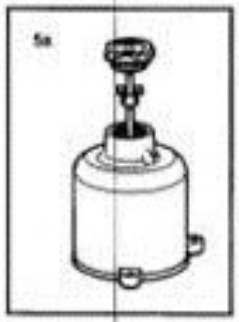
ALT 9113

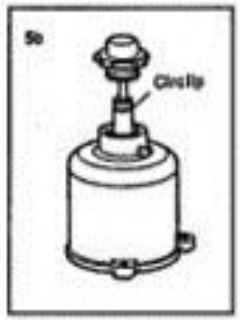
HS2, HS4 and HS6
Dismantling



1

(a) Thoroughly clean the outside of the carburetters.
(b) Standard suction chambers. Remove the piston damper (1) and its washer (2), if fitted.
(c) Unscrew the suction chamber retaining screws (3).
(d) Lift the chamber assembly (4) vertically from the body without tilting it.





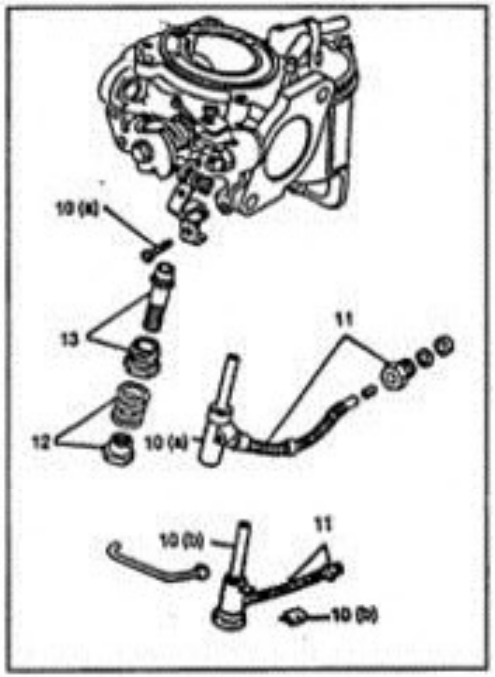
2

Ball bearing suction chambers (early type). Hold the piston firmly and pull the suction chamber, taking care not to bend the damper rod, until the bearing retainer is freed from the piston rod (5a). Remove the damper.

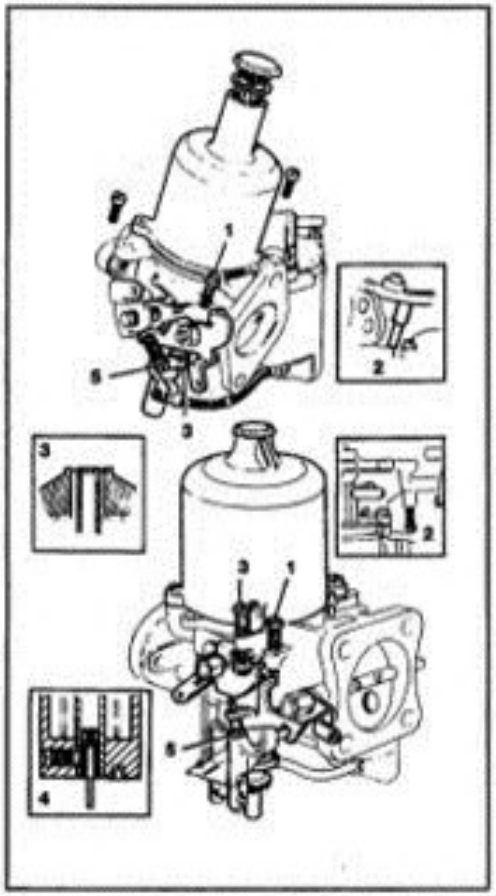
Ball bearing suction chambers (later type). Remove the piston damper. Lift the piston and remove the bearing retaining circlip (5b).

3

(a) Separate the suction chamber, the spring and the piston assembly and empty the oil from the piston rod (6).
(b) Unscrew the needle guide locking screw, then withdraw the needle, guide and spring (7). For fixed needle HS carburetters, refer to pages 170-171 for needle fitment and jet centering.
(c) Remove the piston lifting pin circlip and spring and withdraw the pin from the body (8).
(d) Release the pick-up lever return spring from its retaining lug (9).



All Types
Tuning (General)



1

(a) Remove the air cleaner(s).

(b) Check the throttle for correct operation and signs of sticking.

(c) Unscrew the throttle adjusting screw (each screw on multi-carburetters) until it is just clear of the throttle lever with the throttle closed, then turn the screw clockwise 1.5 full turns (single), one turn on each (multicarburetters) (1).

(d) Raise the piston of each carburetter with the lifting pin (2) and check that it falls freely onto the bridge when the pin is released. If the piston shows any tendency to stick, the carburetter must be serviced.

2

(a) Lift and support the piston clear of the bridge so that the jet is visible; if this is not possible due to the installed position of the carburetter, remove the suction chamber assembly.

(b) Turn the jet adjusting nut/screw up/anti-clockwise, until the jet is flush with the bridge or as high as possible without exceeding the bridge height (3). Ensure that the jets on multi-carburetters are in the same relative position to the bridge of their respective carburetters.

(c) Check that the sintered needle guide is flush with the underside face of the piston (4).

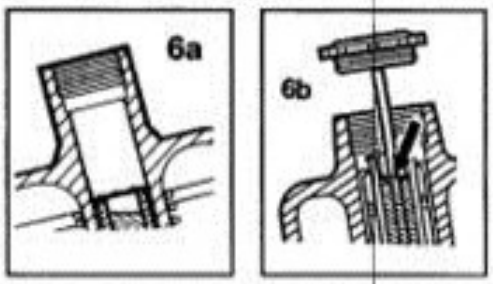
(d) Turn the jet adjusting nut/screw (3) two turns down/clockwise (each nut/screw on multicarburetters).

(e) Turn the fast-idle adjusting screw anti-clockwise (each screw multi-carburetters) until it is well clear of the cam (5).

3

Refit the suction chamber assembly if it has been removed and, using the lifting pin (2), check that the piston falls freely onto the bridge.

Note: If ball bearing suction chambers are fitted take care not to wind up the piston spring when refitting the suction chamber - see reassembly section.



4

Check the piston damper oil level:

(a) **Standard suction chambers.** Unscrew the cap and withdraw the damper. Top up with engine oil (preferably S.A.E. 20) until the level is just below the top of the hollow piston rod, refit the damper and screw the cap firmly into the suction chamber (6a).

(b) **Ball bearing suction chambers (early type).** Unscrew the cap and raise the piston and damper to the top of their travel. Fill the recess in the damper retainer with engine oil (preferably S.A.E. 20), lower the damper until the cap contacts the suction chamber, repeat this procedure until the oil level is just visible at the bottom of the retainer recess. Screw the cap firmly into the suction chamber. It is essential that the bearing retainer is not displaced from its position in the piston rod (6b).

(c) **Ball bearing suction chambers (later type).** Unscrew the damper cap and withdraw the damper. Top up with engine oil (preferably S.A.E. 20) to within 6.5 mm (0.25 in) of the top of the hollow piston rod. Refit the damper and screw in firmly.

5

(a) **Vehicles with emission control.** Connect a reliable tachometer to the engine in accordance with the instrument manufacturer's instructions.

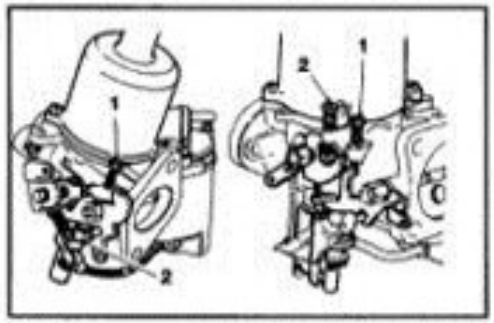
(b) Start the engine and run it at a fast-idle speed until it attains normal running temperature, then run it for a further five minutes.

(c) Increase the engine speed to 2,500 r.p.m. for 30 seconds.

(d) **Vehicles with emission control.** Connect an exhaust gas analyser to the engine in accordance with the instrument manufacturer's instructions.

Setting can now commence. If the correct setting cannot be obtained within three minutes, increase the engine speed to 2,500 r.p.m. for 30 seconds and then re-commence tuning. Repeat this clearing operation at three-minute intervals until tuning is completed.

Single Carburetters

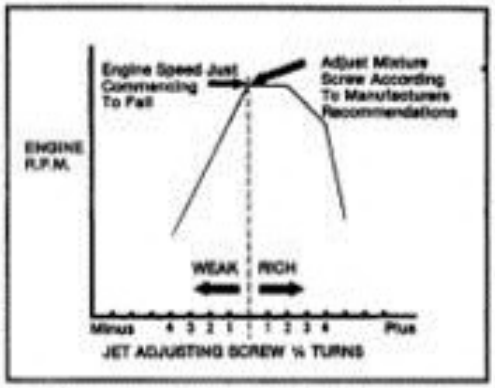


1

(a) Adjust the throttle adjusting screw (1) until the correct idle speed is obtained (see vehicle manufacturer's tuning data).

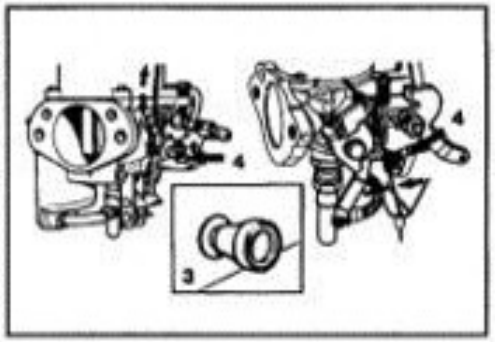
(b) Turn the jet adjusting nut/screw (2) down/clockwise, to enrich or up/anti-clockwise to weaken, until the fastest speed is indicated; turn the nut/screw up/anti-clockwise until the engine speed just commences to fall. Turn the nut/screw down/clockwise very slowly the minimum amount until the maximum speed is regained. From this setting adjust the mixture screw according to the vehicle manufacturer's recommendations.

(c) Check the idle speed, and readjust it as necessary with the throttle adjusting screw to obtain the correct setting.



2

Vehicles with emission control. Using the exhaust gas analyser, check that the percentage CO reading is within the limits given by the vehicle manufacturer. If the reading falls outside the limits given, reset the jet adjusting nut/screw by the minimum amount necessary to bring the reading just within the limits given. If an adjustment exceeding three flats of the nut/half a turn of the adjusting screw is required to achieve this, then the carburetters must be removed and serviced.



3

(a) With the fast-idle cam against its return stop, check that a 1.6 mm (1/16 in) free movement of the mixture control (choke) cable exists before the cable moves the cam.

(b) Pull out the mixture control (choke) (3) until the linkage is about to move the jet.

(c) Turn the fast-idle adjusting screw (4) clockwise until the correct fast-idle speed is obtained (see the vehicle manufacturer's recommendations).

(d) Refit the air cleaner.

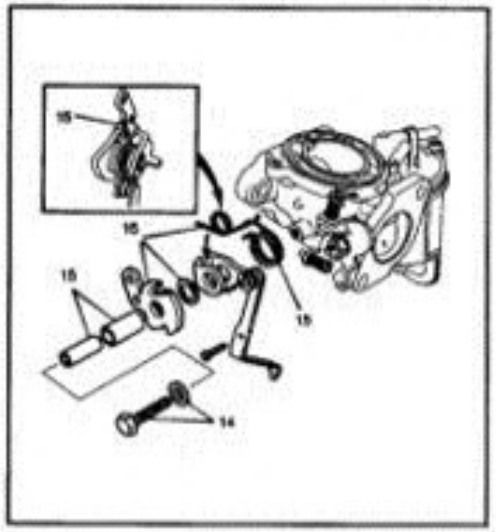
4

(a) **Standard jet.** Support the plastic moulded base of the jet and remove the screw retaining the jet pick-up lever and link bracket (when fitted)(10a).
Capstat jet. Remove the clip holding the wire link to the jet housing (10b).

(b) Unscrew the jet tube sleeve nut from the float-chamber and withdraw the jet assembly (11). Note the gland, washer and ferrule at the end of the jet tube.

(c) Remove the jet adjusting nut and spring (12).

(d) Unscrew the jet locking nut and detach the nut and jet bearing, withdraw the bearing from the nut (13).



5

(a) Unscrew and remove the lever pivot bolt and distance washer (14).

(b) Detach the cam lever assembly and return springs, noting the pivot bolt tubes, skid washer and the locations of the cam and pick-up lever springs (15).

6

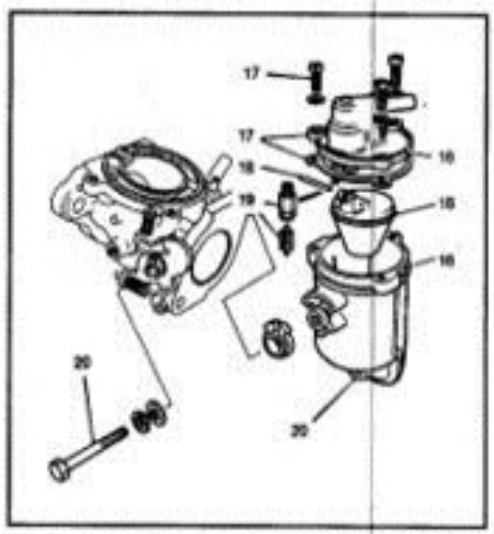
(a) Mark the float-chamber lid location to facilitate accurate reassembly (16).

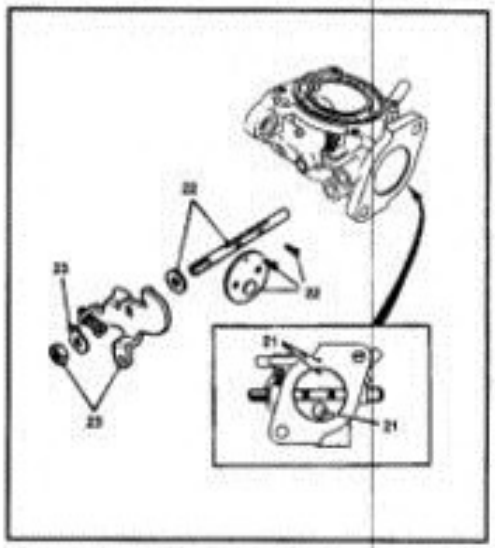
(b) Remove the lid securing screws and detach the lid with its joint washer and float (17).

(c) Hold the float hinge pin at its serrated end and withdraw the pin and float (18).

(d) Extract the float needle from its seating and unscrew the seating from the lid (19).

(e) Remove the float-chamber securing bolt and the chamber (20).





7

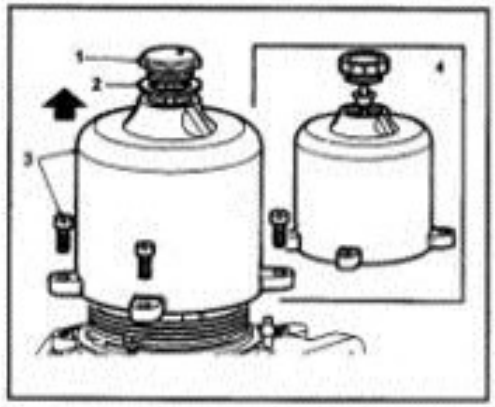
(a) Close the throttle and mark the position of the throttle disc in relation to the carburetter flange. Do not mark the disc in the vicinity of the overrun valve (21).

(b) Remove the throttle disc retaining screws, open the throttle and carefully withdraw the disc from the throttle spindle taking care not to damage the overrun valve (22).

(c) Tap back the tabs of the lock washer securing the spindle nut, remove the nut and detach the throttle lever, washer and the throttle spindle; note location of the lever in relation to the spindle and carburetter body (23).

HS4C and HS8

Dismantling



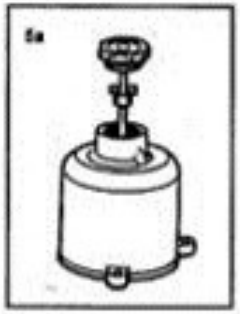
1

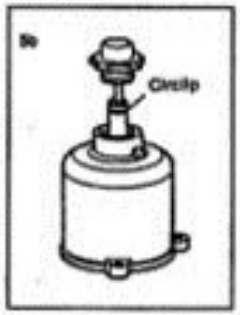
(a) Thoroughly clean the outside of the carburetter.

(b) **Standard suction chambers.** Remove the piston damper (1) and its washer (2), if fitted.

(c) Unscrew the suction chamber retaining screws (3).

(d) Lift the chamber assembly vertically from the body without tilting it (4).



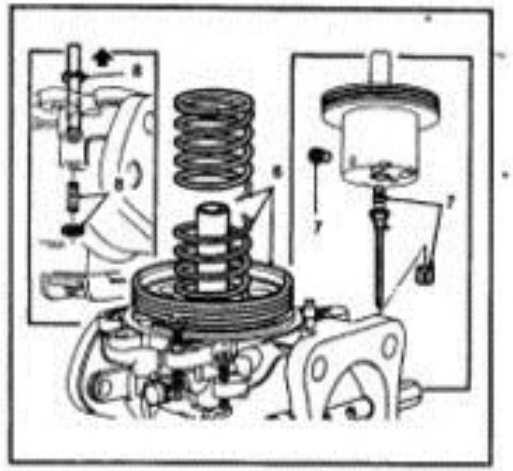


2

Ball bearing suction chambers (early type). Hold the piston firmly and pull the suction chamber, taking care not to bend the damper rod, until the bearing retainer is freed from the piston rod (5a). Remove the damper.
Ball bearing suction chambers (later type). Remove the piston damper. Lift the piston and remove the bearing retaining circlip (5b). Note: ball bearing suction chambers are not available for HS8 carburetters.

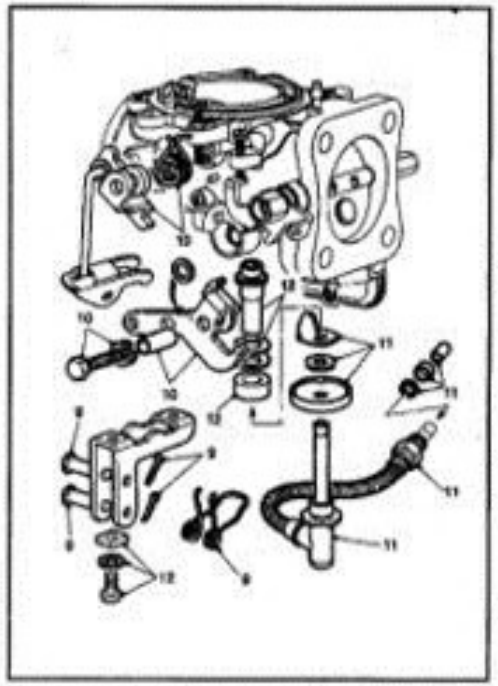
3

(a) Separate the suction chamber, the spring and the piston assembly and empty the oil from the piston rod (6).



(b) Unscrew the needle guide locking screw, then withdraw the needle, guide and spring (7).

(c) Remove the piston lifting pin circlip and spring, withdraw the pin from the body (8).



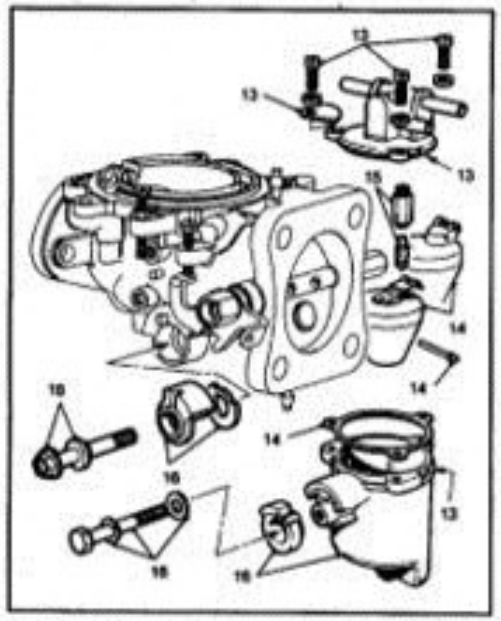
4

(a) Remove the split pins retaining the jet spring anchor pin and jet fork pivot pin. Remove the pins, spring and jet fork from the bracket (9).

(b) Release the cam lever return spring from its lug, remove the bolt, washers, cam lever, bush and link arm assembly (10).

(c) Unscrew the jet tube sleeve nut from the float chamber and withdraw the jet assembly complete with centring washer, copper washer and ferrule at the end of the jet tube (11).

(d) Remove the bolts, starlock washers and spacers securing the fork bracket to the carburetter body and withdraw the jet bearing together with the bush and Bellville washers (12).



5

(a) Mark the relative position of the float lid and chamber, remove the float lid retaining screws, washers and identification tag (13).

(b) Remove the float lid and gasket, withdraw the float hinge pin and remove the float (14).

(c) Withdraw the float needle and unscrew the needle seat (15).

(d) Remove the float chamber securing bolt, float chamber and metal spacer or rubber mounting and backing washer (16).

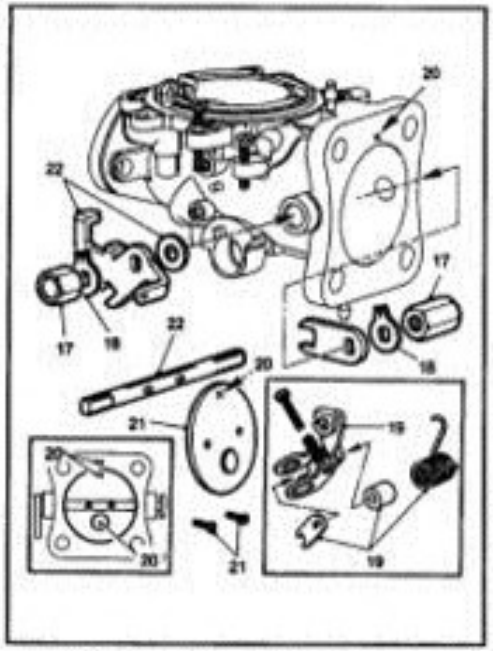
6

(a) HS4C - release the return spring from the throttle lever.

(b) Bend back the tabs and remove the throttle spindle nut(s) (17) and tab washer(s) (18).

(c) HS4C - withdraw the lost motion lever, throttle actuating lever, return spring and spacer (19).

(d) Close the throttle and mark the position of the throttle disc in relation to the carburetter flange (20). Do not mark the disc in the vicinity of the overrun valve.



(e) Unscrew the disc retaining screws, open the throttle and ease the disc from its slot in the throttle spindle (21) taking care not to damage the overrun valve.

(f) Remove the throttle lever and washer and withdraw the spindle from the body (22).

All Types
Inspection

1

(a) Examine the throttle spindle and its bearings in the carburetter body; check for any excessive play, and renew any parts as necessary.

(b) Examine the float needle and seating for any damage and excessive wear; renew if necessary.

(c) Check condition of all gaskets; renew as necessary.

2

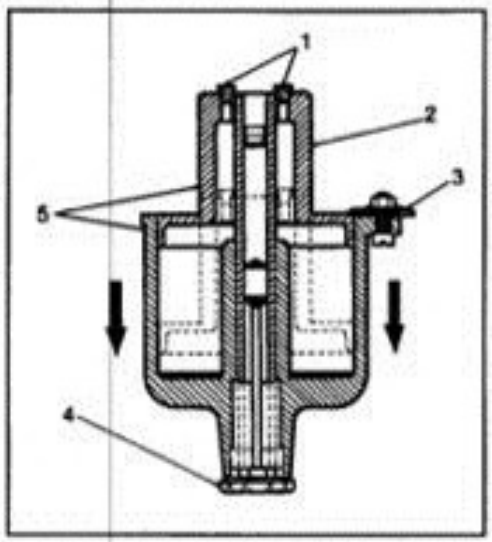
(a) Examine the carburetter body for cracks and damage, and for security of the brass connections and the piston key.

(b) Clean the inside of the suction chamber and the piston rod guide with fuel or methylated spirit (denatured alcohol) and wipe dry. Abrasives must not be used.

(c) Examine the suction chamber and piston for damage and signs of scoring.

3

Ball bearing suction chambers. Check that all the balls are in the piston ball race (2 rows, 6 per row). Fit the piston into the suction chamber, without the damper and spring, hold the assembly in a horizontal position and spin the piston. The piston should spin freely in the suction chamber without any tendency to stick.



4

The following timing check applies only to standard suction chambers and need only be carried out if the cause of the carburetter malfunction which necessitated the dismantling has not been located.

(a) Temporarily plug the piston transfer holes (1).

(b) Fit the piston into the chamber without its spring (2).

(c) Fit a nut and screw, with a large flat washer under the nut, into one of the suction chamber fixing holes, positioning the washer so that it overlaps chamber bore (3).

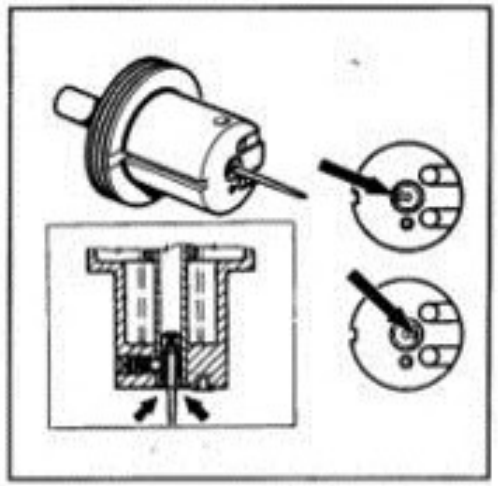
(d) Fit the damper and washer, if fitted (4).

(e) Check that the piston is fully home in the chamber, invert the assembly to allow the chamber to fall away until the piston contacts the washer (5).

(f) Check the time taken for the chamber to fall the full extent of the piston travel. For carburetters 38.0 mm (1.5 in) to 47.6 mm (1 7/8 in) bore, the time taken should be 5 to 7 seconds.

(g) If the times are exceeded check the piston and chamber for presence of oil, foreign matter and damage. If after re-checking the time is still not within these limits, renew the suction chamber assembly.

All Types
Reassembly



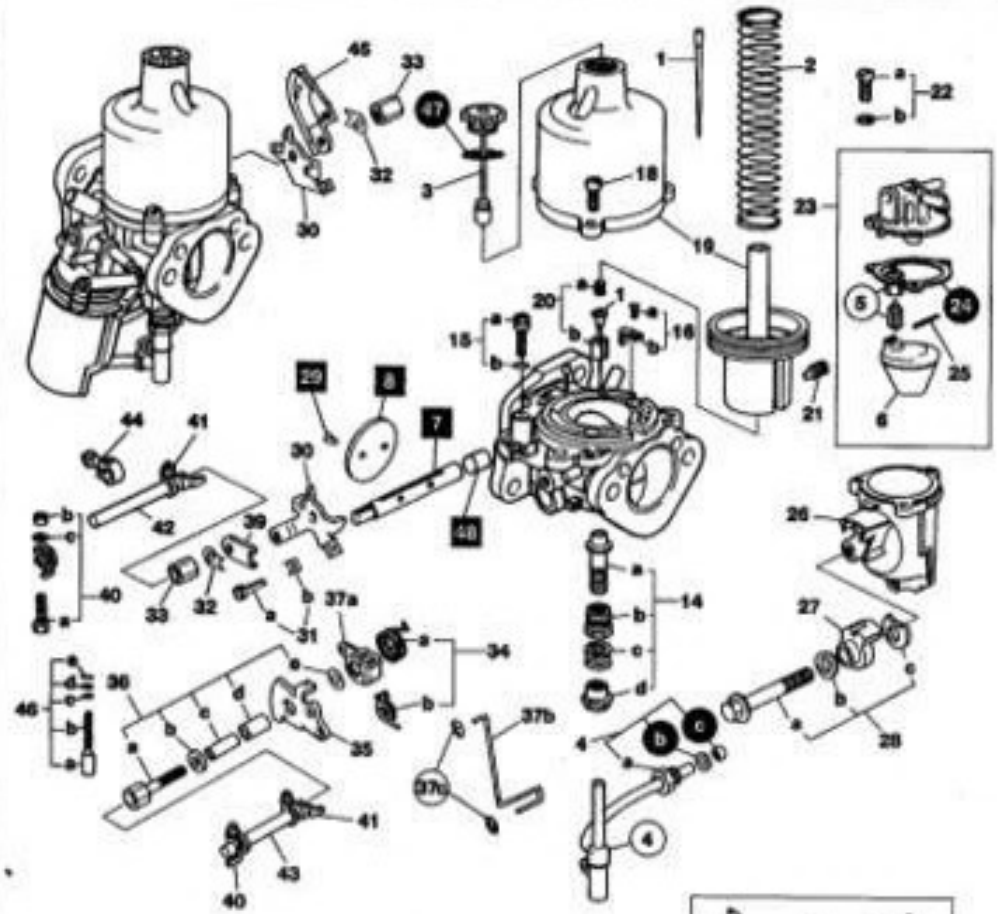
After inspection, reassemble by reversing the procedure used to dismantle the carburetter, noting the following:

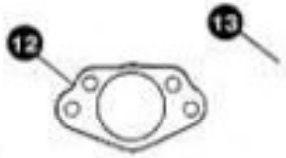
(a) Ensure that the throttle disc is fitted in its original position.

(b) New throttle disc retaining screws must be used when refitting the disc. Ensure that the throttle disc is correctly positioned and closes correctly before tightening the retaining screws. Spread the split ends of the screws sufficiently to prevent turning.

(c) Use a new retaining screw and a new needle guide ensuring that the needle guide fitted gives the needle bias in the required sense (either toward throttle disc or toward air cleaner). Before tightening the retaining screw check that the needle guide is in its correct position relative to the piston face, either flush with the bottom of the piston on standard pistons or flush with the recess on recessed pistons.

(d) **Ball bearing suction chambers.** To prevent the piston spring from being 'wound up' during reassembly, temporarily fit the piston and suction chamber, less the piston spring, to the body and pencil mark their relative positions to each other. Fit the spring to the piston, hold the suction chamber above the piston, align the pencil marks and lower the chamber over the spring and piston. It is essential that the bearing retention clip (early type) or the bearing retention circlip (later type) is correctly fitted.





● Gasket Pack
○ Service Kit (CSK) in addition to Gasket Pack
■ Rebuild Kit (CRK) in addition to CSK

Each kit contains enough components to service one carburetter.
The carburetter illustrated is an HS4 but most HS types are similar.

1 Needle
2 Piston Spring
3 Damper
4 **Jet Assembly**
  a Nut (HS2, HS4 and HS6 only)
  b Washer (HS2, HS4 and HS6 only)
  c Seal (HS2, HS4 and HS6 only)
5 **Needle and Seat Kit**
6 **Float Kit**
7 **Throttle Spindle Kit**
8 **Throttle Disc Kit**
12 Gasket - Air Inlet
13 Gasket - Engine Flange
14 **Jet Bearing Kit**
  a Jet Bearing
  b Jet Lock Nut
  c Spring
  d Jet Adjusting Nut
15 **Idle Adjusting Screw Kit**
  a Idle Adjusting Screw
  b Idle Adjusting Screw Seal or Spring*
16 **Piston Guide Key Kit**
  a Screw
  b Guide Key
17 Circlip
18 Suction Chamber Screws (see 22)
19 Suction Chamber Assembly
20 **Needle Guide Kit**
  a Needle Spring
  b Needle Guide
21 Needle Lock Screw
22 **Float Lid Screw Kit**
  a Float Lid Screw
  b Washer
23 **Float Lid Assembly**
24 Float Lid Gasket
25 Float Spindle
26 Float Chamber
27 Float Chamber Adaptor
28 **Float Chamber Mounting Kit**
  a Bolt
  b Spring Washer
  c Washer
29 Throttle Disc Screw
30 Throttle Lever
31 **Fast-Idle Screw Kit**
  a Adjusting Screw
  b Screw Clip or Spring*
32 Tab Washer
33 Throttle Spindle Nut
34 **Choke Return Spring Kit**
  a Choke Spring
  b Lost Motion Spring
35 Choke Cam Lever
36 **Pivot Bolt Kit**
  a Pivot Bolt (as illustration only)
  b Washer (as illustration only)
  c Inner Tube (as illustration only)
  d Outer Tube (as illustration only)
  e Washer (as illustration only)
37 **Pick Up Lever and Link Kit**
  a Pick Up Lever
  b Pick Up Link
  c Link Clip
37a Pick-Up Lever (waxstat jet)
38 **Link Kit (waxstat jet)**
  a Link (waxstat jet)
  b Clip (waxstat jet)
39 Lost Motion Lever
40 Interconnection Lever (right hand)
41 Interconnection Lever (left hand)
42 Interconnection Rod Throttle
43 Interconnection Rod Choke
44 Throttle Cable Lever
45 Throttle Cable Lever (alternative)
46 **Piston Lift Pin Kit (where fitted)**
  a Piston Lift Pin (as illustration only)
  b Spring (as illustration only)
  c Washer (as illustration only)
  d Washer (as illustration only)
  e Circlip (as illustration only)
47 Damper Washer (where fitted)
48 Throttle Spindle Bush

*Early carbs had screws and spring

Note:
The needle (1) is unique to your car and should be replaced to ensure the best results (see catalogue).
The spindle supplied may be longer than necessary and should be cut to length of original. To ensure that the spindle bushes are a correct fit, great care must be taken to line ream the body of the carburetter

8mm - 1/4 inch diameter spindle
9.5mm - 5/16 inch diameter spindle